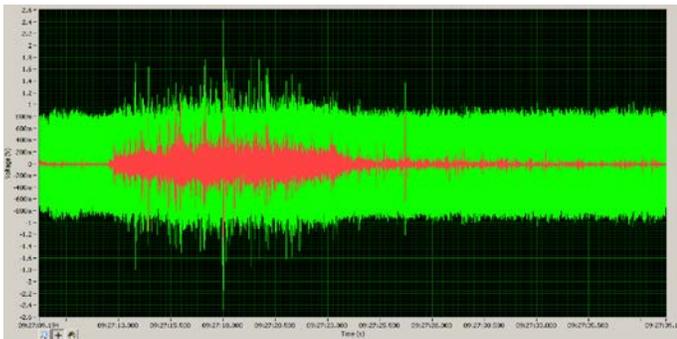


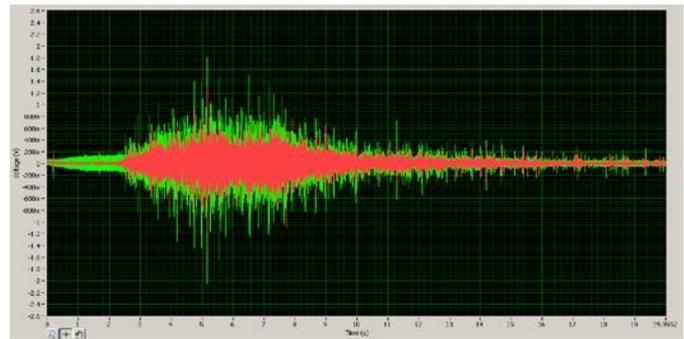
Non-Intrusive Monitoring System for Particles Traveling in a Pipe



Many industrial processes are plagued by particulate materials traveling through enclosures such as pipes and machines. Solutions to Erosion-based sand management have historically employed an intrusive inserted sensor into the pipe's flow-stream. However, more recent solutions have employed acoustic-based techniques to measure sand production by monitoring the sand's impaction with the pipe wall. Current acoustic-based systems rely heavily on extensive data manipulations to filter flow noise and estimate relative sand production. However, this method of estimation provides an opportunity for measurement error, the deleterious effects of which are compounded by real-time continuous measurement. Fortunately, researchers at the University of Louisiana at Lafayette (UL Lafayette) have developed a novel acoustic monitoring system that employs a differential acoustic system for empirical measurement and subtraction of flow noise from sand impaction. Thus, this technology offers an empirical approach to acoustic-based particle monitoring with distinct performance advantages over other acoustic-based commercial system.



Acoustic signal showing the signal due to sand impaction with noise.



Acoustic signal showing the signal due to sand impaction only. Flow noise is eliminated by the differential mode of two acoustic sensors.

KEY ASPECTS OF THE TECHNOLOGY:

- Passive acoustic technology removes the need for invasive measurement instruments;
- Employs a differential acoustic-system for particulate monitoring;
- Wireless embodiment permits scalability and ease of set-up, communication and powering;
- Robust to real-time changes in flow rate & viscosity, particulate size & mass;
- Current research is aimed at defining energy as a function of acoustic wave frequency spectrum and Doppler measurement for development of a universal zero calibration system;
- Based on UL Lafayette patent-pending technology.

UL Lafayette understands the value of this research and technology to various industries. Moreover, we understand that for successful commercial implementation, significant industry acumen & perspective will be needed. Accordingly, we currently seek a commercial partner interested in licensing and/or sponsored-research opportunities. To learn more about this research and/or partnership opportunities please contact UL Lafayette's Office of Innovation Management via the information provided below.

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